

Grm4 Cas9-CKO Strategy

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Project Overview

Project Name

Grm4

Project type

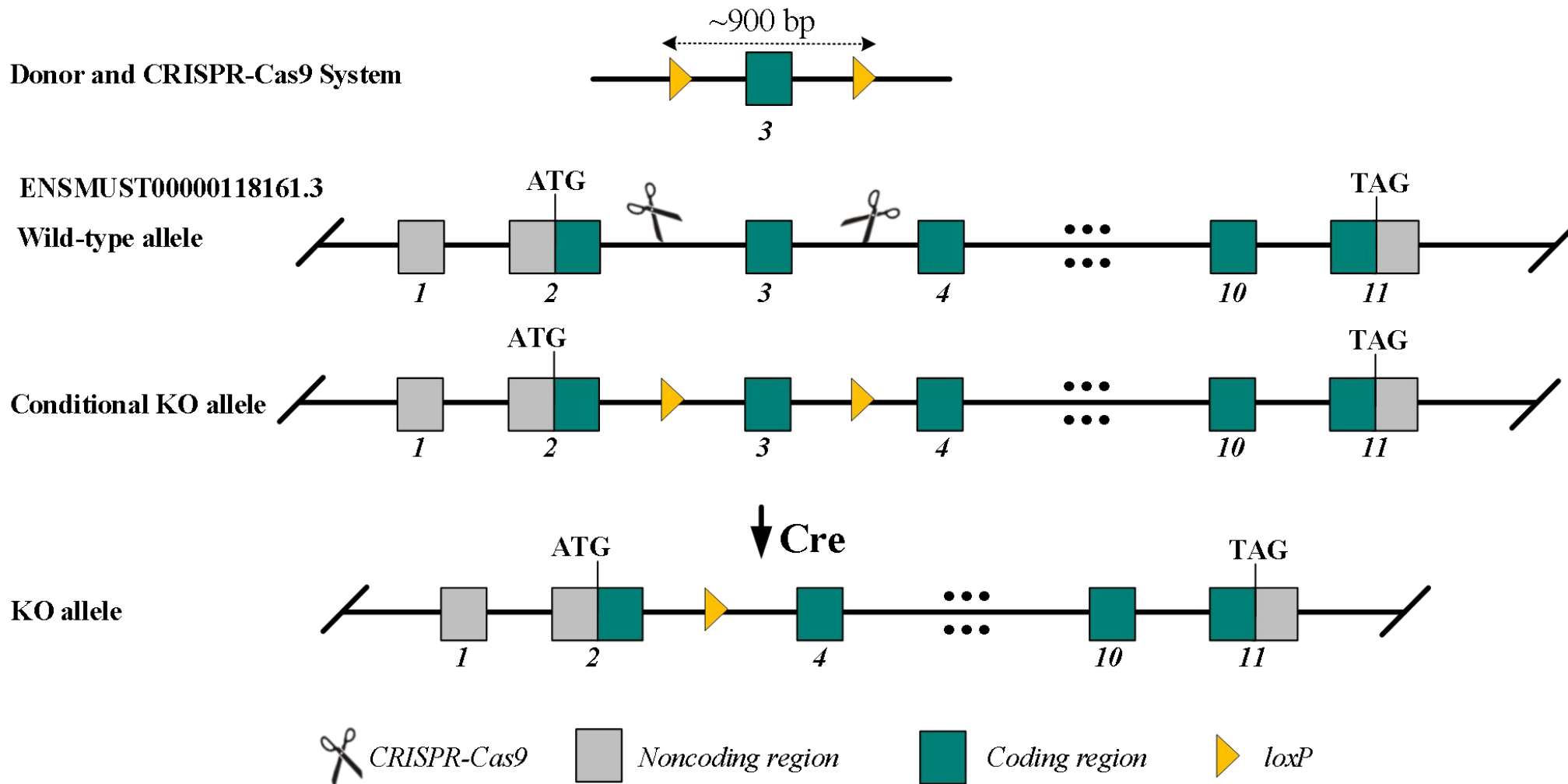
Cas9-CKO

Strain background

C57BL/6JGpt

Conditional Knockout strategy

This model will use CRISPR-Cas9 technology to edit the *Grm4* gene. The schematic diagram is as follows:



- The *Grm4* gene has 8 transcripts. According to the structure of *Grm4* gene, exon 3 of *Grm4-201*(ENSMUST00000118161.3) transcript is recommended as the knockout region. The region contains 217 bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR-Cas9 technology to modify *Grm4* gene. The brief process is as follows: CRISPR-Cas9 system and Donor were microinjected into the fertilized eggs of C57BL/6JGpt mice. Fertilized eggs were transplanted to obtain positive F0 mice which were confirmed by PCR and sequencing. A stable F1 generation mouse model was obtained by mating positive F0 generation mice with C57BL/6JGpt mice.
- The flox mice will be knocked out after mating with mice expressing Cre recombinase, resulting in the loss of function of the target gene in specific tissues and cell types.

- *Grm4*, according to the existing MGI data, homozygous mutation of this gene results in impaired motor learning, and reduced paired-pulse facilitation and post-tetanic potential.
- The effect on *Gm49789-201* and *Gm49790-201* transcript is unknown.
- The *Grm4* gene is located on the Chr 17. If the knockout mice are crossed with other mice strains to obtain double gene positive homozygous mouse offspring, please avoid the two genes on the same chromosome.
- This strategy is designed based on genetic information in existing databases. Due to the complexity of biological processes, all risk of loxp insertion on gene transcription, RNA splicing and protein translation cannot be predicted at existing technological level.

Gene information (NCBI)

Grm4 glutamate receptor, metabotropic 4 [*Mus musculus* (house mouse)]

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Gene ID: 268934, updated on 24-Apr-2022

Summary



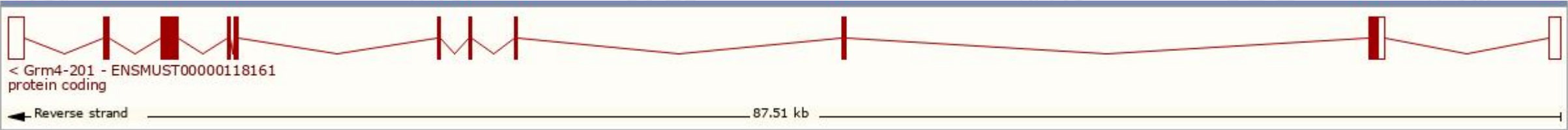
Official Symbol	Grm4 provided by MGI
Official Full Name	glutamate receptor, metabotropic 4 provided by MGI
Primary source	MGI:MGI:1351341
See related	Ensembl:ENSMUSG000000063239 AllianceGenome:MGI:1351341
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	Gprc1d; mGluR4
Summary	Predicted to enable adenylate cyclase inhibiting G protein-coupled glutamate receptor activity; calcium-dependent protein binding activity; and calmodulin binding activity. Involved in regulation of synaptic vesicle exocytosis. Acts upstream of or within chemical synaptic transmission and learning. Located in neuron projection and parallel fiber to Purkinje cell synapse. Is integral component of presynaptic active zone membrane. Is active in glutamatergic synapse. Is expressed in central nervous system; dorsal root ganglion; foot; sensory organ; and skeleton. Orthologous to human GRM4 (glutamate metabotropic receptor 4). [provided by Alliance of Genome Resources, Apr 2022]
Expression	Biased expression in cerebellum adult (RPKM 60.6), frontal lobe adult (RPKM 7.3) and 3 other tissues See more
Orthologs	human all
NEW	Try the new Gene table Try the new Transcript table

Transcript information (Ensembl)

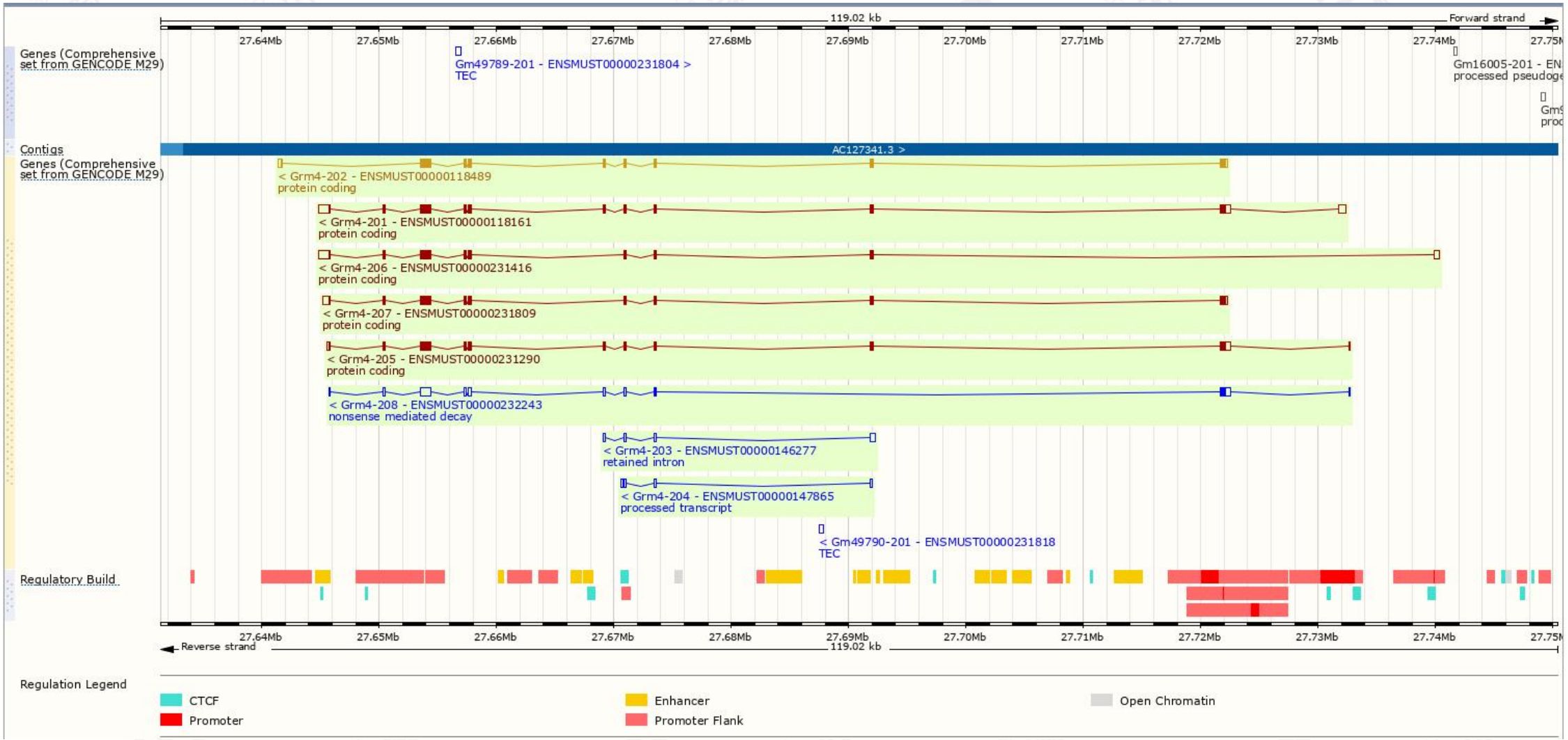
The gene has 8 transcripts,all transcripts are shown below:

Transcript ID	Name	bp	Protein	Biotype	CCDS	UniProt Match	Flags
ENSMUST00000118161.3	Grm4-201	4607	912aa	Protein coding	CCDS70775	G3XA00	Ensembl Canonical GENCODE basic APPRIS P1 TSL:5
ENSMUST00000231416.2	Grm4-206	3451	657aa	Protein coding		A0A338P783	GENCODE basic
ENSMUST00000231290.2	Grm4-205	3417	912aa	Protein coding	CCDS70775	G3XA00	GENCODE basic APPRIS P1
ENSMUST00000231809.2	Grm4-207	3298	865aa	Protein coding		A0A338P7K6	GENCODE basic
ENSMUST00000118489.8	Grm4-202	2976	832aa	Protein coding	CCDS28563	A0A140T8R6	GENCODE basic TSL:1
ENSMUST00000232243.2	Grm4-208	2984	181aa	Nonsense mediated decay		A0A338P6S6	-
ENSMUST00000147865.2	Grm4-204	645	No protein	Processed transcript		-	TSL:3
ENSMUST00000146277.8	Grm4-203	810	No protein	Retained intron		-	TSL:2

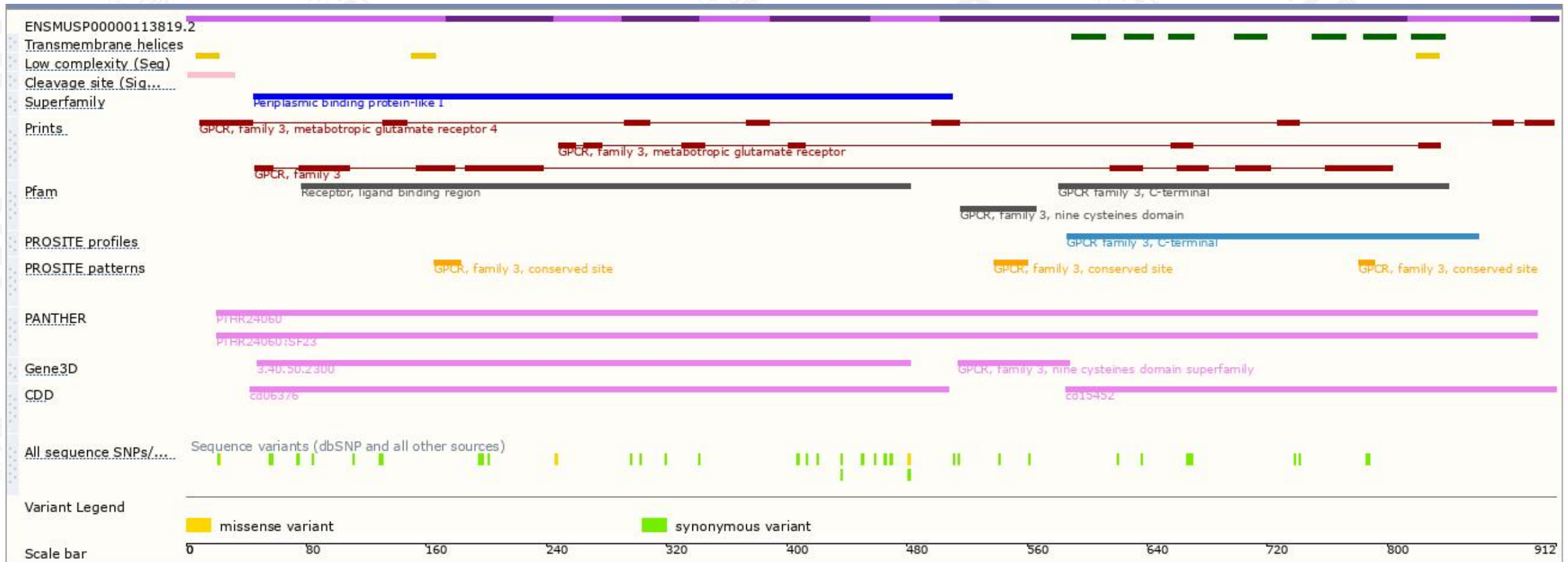
The strategy is based on the design of *Grm4-201* transcript,the transcription is shown below:



Genomic location distribution



Protein domain



If you have any questions, you are welcome to inquire.
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